SAND2015-0662R

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Sandia National Laboratories




International Nuclear Safeguards at Sandia

Mission Focus: Infrastructure Development to Strengthen Nuclear Safeguards

Why Safeguards Infrastructure Development?

As global nuclear energy expands, assuring peaceful uses of nuclear technology becomes increasingly important. In addition to complying with international nuclear safeguards, a responsible nuclear energy program promotes a corresponding safeguards culture. Establishment of transparent peaceful uses of nuclear technologies starts with cooperative international engagements and safeguards systems.

Developing states investing in nuclear energy must assure the international community of their long-term commitment to safeguards, safety, and security (3S) of nuclear materials and technologies. Cultivating a safeguards culture starts in the initial phases of infrastructure planning and must be integrated into the process of developing a responsible nuclear energy program. Sandia National Laboratories supports the implementation of safeguards culture through a variety of activities, including infrastructure development.

Sandia Safeguards

Sandia has a long history of contributions to international nuclear safeguards, starting from the beginning of the U.S. support program to the IAEA in the late 1970's. Sandia is an advanced systems engineering laboratory, able to draw upon broad expertise in areas such as the surety of nuclear weapons, information assurance, domestic and international safeguards, nonproliferation, physical protection, arms control, and the nuclear fuel cycle. Sandia strongly supports the National Nuclear Security Administration's (NNSA) mission of revitalizing, strengthening, and sustaining domestic and international safeguards capabilities through the Next Generation Safeguards Initiative (NGSI).

Core Infrastructure Development Missions for Sandia:

- **Capacity Building: Systems Engineering**
- **3S: A Systems View**
- **Cooperative Technical Engagement**

Sandia's core capabilities in science, engineering, nonproliferation, international engagement, and

technical innovation provide an essential skillset for developing international nuclear safeguards infrastructure. The diversity of expertise allows Sandia to provide high-quality products that help inform nonproliferation efforts and policy decision making. As such, Sandia is a preeminent resource for training, curriculum development and implementation of the infrastructure required to establish responsible nuclear energy programs that integrate 3S.

Sponsor and Partners

Sandia's work is supported principally by multiple offices of NNSA, including NGSI. The Department of Defense/CENTCOM and State Department also sponsor international engagement projects involving nuclear 3S technical engagements and culture. Sandia also collaborates with international partners, other U.S. national laboratories, universities, and industry to develop comprehensive solutions to complex safeguards challenges.

Core Mission Space

Capacity Building: Systems Engineering

Sandia supports several human capital development projects enabling long-term sustainability and capacity building of the next generation of nuclear safeguards and security experts. Through University curriculum development, internships, and professional training courses, Sandia is dedicated to the sustainability of the next generation of nuclear experts worldwide. Sandia's radiation protection, environmental monitoring and risk management capabilities are also important components of capacity building. Examples of Sandia's efforts in these areas include:

- Gulf Nuclear Energy Infrastructure Institute
- Middle East Scientific Institute for Security
- Jordan University of Science and Technology nuclear safeguards curriculum development
- Next Generation Safeguards Professional Network
- Geological Repository Safeguards Studies

3S: A systems View

As developing states expand and invest in nuclear energy, ensuring that principle concepts, tools, and approaches of 3S are adopted and implemented is essential. Sandia promotes 3S culture through technical cooperation and training domestically and abroad. Concepts are taught through train-the-trainer activities and hands-on exercises that support knowledge retention and implementation.

Integration of 3S is one of Sandia's unique capabilities. It is included in nearly all of Sandia's engagement, training, and infrastructure development activities. Facilities and courses incorporating 3S include:

- Integrated Security Facility (ISF): a distinct training facility that can support 3S
- Technology Training and Demonstration Area: showcases 3S technology systems
- International Training Course on Physical Protection of Nuclear Facilities/Materials

Cooperative Technical Engagement

International safeguards cooperation and infrastructure development fosters confidence building measures (CBMs) which directly support nuclear technology transparency and the nonproliferation regime. Sandia has extensive experience with CBMs, including transparency cooperation in the Asia Pacific and Middle East, as well as cooperative technical engagements in South America and Europe.

For two decades, Sandia has promoted international nonproliferation transparency cooperation. A primary driver has been the rapid growth of nuclear energy development and the need for energy security. With such increases come concerns about nuclear proliferation. Robust, transparent partnerships and international cooperative technical engagements can help address these concerns and Sandia is vastly experienced in this area of future growth.

For additional information:

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U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND NO. 2014-XXXXX

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